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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,000	07/26/2001	Warren G. Williamson	0315-000508	1121

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EXAMINER

KERNS, KEVIN P

ART UNIT	PAPER NUMBER
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1725

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DATE MAILED: 02/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/916,000	Applicant(s) WILLIAMSON, WARREN G.	
	Examiner Kevin P. Kerns	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: keys "66" (should be labelled in Figure 1), described on page 6, line 4, of the specification. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "GREEN SAND CASTING METHOD AND APPARATUS".

3. The disclosure is objected to because of the following informalities: the abbreviation "Disa" on page 2, line 4, should be spelled out for further clarity. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1725

5. Claims 11 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation "the cup". There is insufficient antecedent basis for this limitation in the claim.

Claim 17 recites the limitation "the fusible disk". There is insufficient antecedent basis for this limitation in the claim. This limitation should probably be changed to "the fusible plug".

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1725

8. Claims 1, 6, 8-11, 16-19, 24, 26, 28-30, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohla et al. (US 5,390,723).

Mohla et al. disclose a method of treating casting metals, in which a vertically parted mold assembly containing a sprue and runner system encloses a series of molding cavities defining patterns (cores) therein (abstract; column 3, lines 62-68; column 4, lines 1-16; and Figures 1-4). The sprue contains a consumable (fusible) plug assembly comprised of a steel disc-shaped member (abstract; column 2, lines 28-39; column 3, lines 22-30; column 5, lines 18-44). One of ordinary skill in the art would have recognized that the shapes of the patterns/cores within the molding cavities disclosed by Mohla et al. would be readily modified to form a plurality of selected shapes and sizes with limited molten metal turbulence, or backsplash, for producing articles without metal slag or inclusions. With regard to the positioning of the sprue and pouring basin, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include these features in either the first or second side pattern, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70. The features disclosed by Mohla et al. are advantageous for allowing non-turbulent flow of molten metal into the molding cavities (column 4, lines 12-16).

9. Claims 2, 7, 23, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohla et al. (US 5,390,723) in view of Menningen (US 2,919,479).

Mohla et al. disclose or suggest the elements of claims 1 and 24 above. Mohla et al. do not teach the use of shell molds or a hollow core therein.

However, Menningen discloses a shell mold comprised of a plurality of mold elements defining multiple mold cavities and a core (column 1, lines 10-13 and 62-69; column 2, lines 29-31; column 3, lines 18-24; and Figures 1, 3, and 4). The hollow core acts as a sprue having conduits for directing molten metal from the core into the mold cavity (column 3, lines 22-24; and Figure 1). The shell mold is resin bonded (column 1, lines 41-45). This shell mold is advantageous for preventing detrimental flash on surfaces (column 2, lines 8-28).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the vertically parted mold assembly disclosed by Mohla et al., by using the shell mold with a plurality of mold elements, as taught by Menningen, in order to prevent detrimental flash on surfaces (Menningen; column 2, lines 8-28).

10. Claims 3-5, 12-15, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohla et al. (US 5,390,723) in view of Seidinger (US 4,913,218).

Mohla et al. disclose or suggest the elements of claims 1 and 24 above. Mohla et al. do not teach the use of a molten metal filter.

However, Seidinger discloses a feeder sprue system for a casting mold, in which a vertically parted mold contains a sprue cup for receiving molten metal, and the feeder contains a gate through the core and a filter (abstract; column 1, lines 5-8; column 2,

Art Unit: 1725

lines 32-64; and Figures 1-3). The region below the filter is further provided with a J-shaped (backsplash) cavity for reducing molten metal flow turbulence (column 2, lines 56-64; and Figure 3). The advantages of the filter and (backsplash) cavity include production of high quality castings at reduced filling times (column 1, lines 43-46).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the vertically parted mold assembly disclosed by Mohla et al., by adding the filter element and J-shaped cavity, as taught by Seidinger, in order to produce high quality castings at reduced filling times (Seidinger; column 1, lines 43-46).

11. Claims 20-22, 31, and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohla et al. (US 5,390,723) in view of Fisher et al. (US 5,033,531).

Mohla et al. disclose or suggest the elements of claims 1, 24, and 34 above. Mohla et al. do not teach the adhesive, inoculant, and graphite aspects of the fusible plug assembly.

However, Fisher et al. disclose an iron casting method and mold for which a filter member in the flow cavity has a plurality of cells that contain an inoculant, such as graphite (abstract; and column 2, lines 63-66). The cells of the filter may be coated with a first layer of an adhesive and a second layer of particulate inoculant (column 3, lines 20-25 and 63-68; and column 4, lines 1-2 and 29-51). These features are advantageous for reducing casting inclusions (column 4, lines 47-49).

Art Unit: 1725

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the vertically parted mold assembly disclosed by Mohla et al., by adding the filter member with a plurality of inoculant-containing cells, as taught by Fisher et al., in order to reduce casting inclusions (Fisher et al.; column 4, lines 47-49).


Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Duchenne, Jeanneret, Hukuhara, and Evans et al. references are also cited to show related art. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (703) 305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KPK
kpk
February 12, 2002


ALEXANDRA ELVE
PRIMARY EXAMINER